In the Claims

Please cancel Claims 10 and 19.

Please amend Claims 1, 5-9, 11-13, as indicated in the Complete Listing of Claims below:

Complete Listing of Claims

Claim 1 (currently amended): A vertical cavity surface emitting laser comprising:

a substrate;

a first n-type mirror adjacent the substrate;

an active region including one or more quantum wells, the quantum wells being formed of InGaAsN;

a second n-type mirror adjacent the active region, the second mirror including a tunnel junction for injecting holes into the active region,

wherein the laser emits light at a nominal wavelength of 1300 nm.

Claim 2 (original): The vertical cavity surface emitting laser of claim 1, wherein the substrate includes GaAs.

Claim 3 (original): The vertical cavity surface emitting laser of claim 1, wherein the tunnel junction includes a n-type layer and a p-type layer.

Claim 4 (original): The vertical cavity surface emitting laser of claim 3, wherein the p-type layer of the tunnel junction is positioned at or near a standing wave null in optical field.

Claim 5 (currently amended): The vertical cavity surface emitting ~~layer~~ laser of claim 2, further comprising one or more oxide apertures, proximate to the active region, wherein the oxide aperture includes an oxidized portion therein.

Claim 6 (currently amended): The vertical cavity surface emitting ~~layer~~ laser of claim 5 wherein the oxidized portion of the oxide aperture comprises an aluminum oxide.

Claim 7 (currently amended): The vertical cavity surface emitting ~~layer~~ laser of claim 5 wherein the oxide aperture comprises a carbon doped spike positioned at or near a standing wave null in optical field.

Claim 8 (currently amended): The vertical cavity surface emitting ~~layer~~ laser of claim 5, further comprising a mesa extending downward at least to the oxide aperture.

Claim 9 (currently amended): The vertical cavity surface emitting ~~layer~~ laser of claim 1 wherein the first and second n-type mirrors comprise unipolar distributed Bragg reflector mirrors.

Claim 10 (cancelled)

Claim 11 (currently amended): The vertical cavity surface emitting ~~layer~~ laser of claim 1 further comprising an upper electrode above the second mirror stack and a lower electrode below the active region.

Claim 12 (currently amended): The vertical cavity surface emitting ~~layer~~ laser of claim 11 wherein the lower electrode includes an annular aperture therein to monitor transmitted output power of the ~~VCSEL~~ vertical cavity surface emitting laser from light emitted through the annular aperture in the lower electrode.

Claim 13 (currently amended): A method of manufacturing a surface emitting laser that emits light at a nominal wavelength of 1300 nm., comprising:
forming a first n-type mirror on a substrate;
forming an active region having one or more InGaAsN quantum wells on the substrate;
forming a current constriction proximate the active region;
forming a second n-type mirror above the active region; and
forming a tunnel junction in the second n-type mirror, wherein the tunnel junction comprises an n-type region and a p-type region and the p-type region is positioned at or near a standing wave null in optical field.

Claim 14 (original): The method of claim 13 wherein the step of forming a current constriction comprises forming oxide aperture layers proximate to said active region.

Claim 15 (original): The method of claim 14 wherein the step of forming oxide aperture layers proximate to said active region comprises forming at least one aluminum alloy layer proximate to said active region.

Claim 16 (original): The method of claim 15 further comprising forming a mesa downward from upper most surface of the surface emitting laser to the oxide aperture layers and oxidizing an annular portion of said oxide aperture layers.

Claim 17 (original): The method of claim 15 wherein the step of forming oxide aperture layers further comprises doping each aluminum alloy layer with an n-type or p-type dopant.

Claim 18 (original): The method of claim 17 wherein the step of doping the aluminum alloy layer with the p-type dopant further comprises forming a carbon doped spike in said aluminum alloy layer, wherein said carbon doped spike is positioned at or near a standing wave null in the optical field.

Claim 19 (cancelled)

Claim 20 (original): The method of claim 13 wherein the step of forming said second mirror comprises forming one or more pairs of semiconductor mirror layers, wherein one layer in each pair has an index of refraction that is different from the index of refraction of the other layer in each pair.

Claim 21 (original): The method of claim 20 wherein the step of forming said semiconductor mirror layers comprises forming one quarter wavelength thick alternating layers of AlGaAs and GaAs, wherein said tunnel junction is formed into the GaAs layer nearest said active region.

Claim 22 (original): The method of claim 13 further comprising forming an upper electrode above the second mirror and forming a lower electrode below the active region.

Claim 23 (original): The method of claim 22 wherein the steps of forming the upper and lower electrodes comprises forming at least one of the upper and lower electrodes having an annular aperture therein.